



Evaluation quality of desalinated water derived from inclined copper-stepped solar still

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Received 25 January 2018; Accepted 15 August 2018

ABSTRACT

Nowadays, fresh drinking water has become increasingly scarce, especially in arid and semi-arid areas. Usually, the water found in these areas is seawater or brackish water and contains harmful contaminants, which directly affect human health, and therefore cannot be used for drinking purposes. Since arid and semi-arid areas are blessed with abundant solar radiation, small solar still units can be used to desalinate seawater and produce cheap drinking water. In this study, the capacity of an inclined copper-stepped solar still to produce fresh drinking water from seawater using solar energy was experimentally tested. This study aims to evaluate the distilled water quality produced by the solar desalination system. The system effectively eliminated all physicochemical parameters such as total suspended solids (TSS), pH, total dissolved solids (TDS), turbidity, salinity, conductivity, and atomic elements (Ca²⁺, Cl⁻, Mg²⁺, Na⁺, SO₄²⁻, and K⁺). Biological analyses were also conducted in this study including the analysis of ammoniacal nitrogen (NH₃-N), biological oxygen demand (BOD), and chemical oxygen demand (COD). Each parameter was found to have values that are within the safe limits set by the Malaysian NDWQS and WHO.

Keywords: Water desalination; Inclined stepped solar still; Drinking water quality; Solar energy; Malaysia NDWQS; WHO

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